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A FURTHER DESCRIPTION OF *LIPOSCELIS ENTOMOPHILUS* (ENDERLEIN) (CORRODENTIA, LIPOSCELIDAE), WITH A NOTE ON ITS SYNONYMY

By Edward Broadhead, M.A., B.Sc., F.R.E.S.

Liposcelis entomophilus was described by Enderlein (1907) from a number of specimens living among dead insects received by the Stettin Museum from Colombia. More recently Pearman described two new species, *L. bakeri* (1928) and *L. virgulatus* (1929), and remarked on the close affinities of these three species, particularly in the colour and markings. The chief differences between *bakeri* and *virgulatus* given by Pearman were in the chaetotaxy of the thoracic sternites and in the pigmentation near the antennal sclerites. The type specimens of *bakeri* and *virgulatus* and two of the cotypes of *entomophilus* have been examined. There is no doubt that all these specimens are conspecific. A further description of *L. entomophilus* with a new description of the male of this species is given, based upon a study of large numbers of specimens reared on dried yeast at 25° C. and 76% R.H. I wish to thank Professor G. D. Hale Carpenter of the Hope Department of Entomology, Oxford, for the loan of the type specimen of *L. bakeri*, and the authorities of the British Museum for permission to examine the types of *L. virgulatus* and *L. entomophilus*.

Liposcelis entomophilus (Enderlein)—further description.

Troctes entomophilus Enderlein, 1907, *Stett. ent. Ztg.* **68** : 34–36, 1 fig.
Liposcelis bakeri Pearman, 1928, *Ent. mon. Mag.* **64** : 133, figs. 1 and 2.
Liposcelis virgulatus Pearman, 1929, *Ent. mon. Mag.* **65** : 106–107, fig. 2*a*, *b*.

Female. Colour (of freshly killed individuals against a white background at magnification of 62 diameters in artificial light; colour nomenclature of Ridgway, 1912): Body semi-transparent. Upperside: shiny buff; thorax and abdomen Cream Colour; cranium slightly more yellowish; clypeus reddish; eyes black; antennae and legs a little greyer than abdomen; maxillary palpi and tarsi almost colourless; reddish-brown transverse bands of width one-third to one-half length of abdominal tergite posteriorly on tergites 3 and 4, that on tergite 3 usually continuous, that on tergite 4 usually interrupted medially, tergite 5 without a band, tergites 6, 7, 8 and 9 with such bands towards anterior margins, all these broadly interrupted medially; red pigment granules very sparse, a few on head between eyes and antennae, on posterior margin of metathorax and on abdominal tergites within the reddish-brown bands. Underside: more glossy buff; mouth parts more reddish; red pigment granules absent.

Sculpturing (stained with acid fuchsin and mounted in balsam): head dorsally with distinct arched ridges enclosing transverse spindle-shaped areas almost smooth or bearing indistinct minute tubercles, more distinct tubercles laterally especially near eye. Abdominal tergites with transverse spindle-shaped areas enclosing distinct tubercles, the areas separated by plain narrow tracts bordered by rows of tubercles. Epicranial suture indicated by a break in the sculpturing.

Head: with fine hairs uniformly scattered, average length of hairs (0·019 mm.) almost three times width of adjacent spindle-shaped areas on cuticle, distance between hairs (0·015 mm.) equal to or slightly less than length of hairs. Eye with 5–8 ommatidia: in 67 eyes, 1 with 5, 6 with 6, 30 with 7, 30 with 8 ommatidia (in single individuals many combinations occurred).

Thorax : with fine hairs uniformly scattered ; 4–5 stronger and longer bristles, truncated distally, on lateral lobe of pronotum on each side (fig. 1), one on lateral tip ("humeral seta"), the others shorter and thinner and, with humeral seta, forming a transverse row towards anterior margin, with 3–5 small fine hairs more posteriorly near humeral seta. Prothoracic sternite with 4–7 bristles anteriorly arranged in a transverse arched row—in 50 specimens, 4% with 4 bristles, 58% with 5, 36% with 6, 2% with 7. Meso-metathoracic sternite with transverse slightly arched row of 6–11 bristles towards anterior margin—in 50 specimens, 2% with 6 bristles, 6% with 7, 24% with 8, 42% with 9, 20% with 10, 6% with 11.

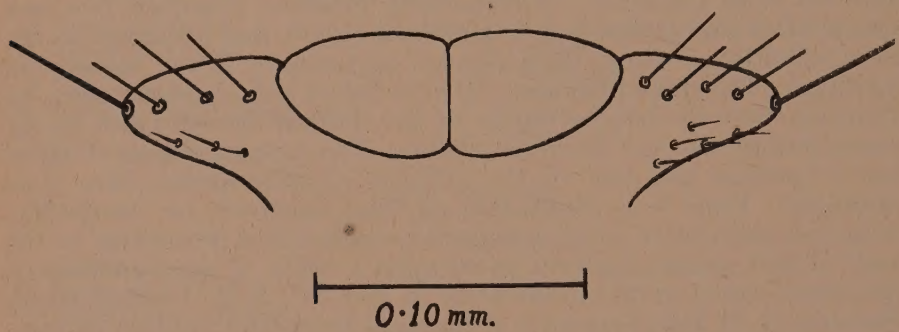

Fig. 1.—*Liposcelis entomophilus* ♀ prothorax dorsal view to show chaetotaxy of lateral lobes.

Abdomen : with short fine hairs uniformly scattered, average length of these hairs (on tergites 3–7) 0·012 mm. ; with long strong bristles, truncated distally and dilated apically, on 8th, 9th and 10th tergites laterally, on epiproct, paraprocts and subgenital plate ; five such bristles on each side of almost equal length and longer than the adjacent bristles, one of these on lateral margin of 8th tergite, two on lateral margin of 9th and two on lateral margin of 10th tergite, the bristle measured (Table 1) situated more ventrally on lateral margin of 9th tergite between basal horns of gonopods. Towards base of epiproct on each side of a mid line a bristle (Table 1), truncated distally, much longer than adjacent bristles on epiproct but shorter than the two bristles on 9th tergite laterally. Tergites 1 and 2 each divided into two transverse bands interrupted medially, width of the three anterior bands subequal, posterior band of segment 2 of width almost twice width of each of the more anterior bands. Remaining tergites uniformly sclerotised.

Body length 1·28–1·38 mm. (20 measurements). Various body measurements are given in Table 1.

England : in mouldy wheat heavily infested with *Calandra*, *Laemophloeus* and *Tribolium*, Clarke and Butcher's Mills, Soham, London (*given to me by L. H. Finlayson*).

Other records from the literature :—

England : among West African cacao in Metropolitan Wharf, London, 4th May, 1928 (J. V. Pearman, 1929) ; in sample of Accra cacao, 7th October, 1930 (J. V. Pearman, 1931).

New Hebrides : Espiritu Santo, Hog Harbour, in camp, 9th March, 1927 (J. V. Pearman, 1928).

Mozambique : Nova-Choupanga, February, 1928 (Badonnel, 1931).

South America : among dead insects received by the Stettin Museum from Colombia, 10th August, 1906 (Enderlein, 1907).

TABLE 1.

Liposcelis entomophilus (Enderlein). ♀, linear measurements.

	Number measured	Mean (mm.)	Standard deviation	Extremes	
Width of head capsule ...	60	0·292	0·007	0·280	0·313
Length of 4th antennal segment	25	0·071	0·006	0·062	0·081
Greatest width of hind femur	60	0·178	0·008	0·160	0·196
Length of humeral seta ...	40	0·050	0·003	0·043	0·057
Length of longest apical abdominal bristle	40	0·076	0·003	0·069	0·083
Length of bristle on epiproct	29	0·065	0·006	0·055	0·076

Male. Colour: Body semi-transparent. Upperside shiny buff; thorax and abdomen Light Buff; cranium more yellowish; clypeus reddish; eyes black; antennae and legs a little greyer than abdomen; maxillary palpi and tarsi almost colourless; with the following parts brown and presenting a strong contrast to the light buff ground colour: antero-laterally on head between eye and antennal sclerite, in some individuals posteriorly on head, laterally on thorax and 1st abdominal segment, one short posterior transverse band on each side on 2nd abdominal segment, a broad lateral band on tergites 3, 4 and 5 of width equal to one-third width of abdomen, and, towards posterior margin of tergites 3 and 4, with a darker more reddish narrow transverse band composed of red pigment granules interrupted medially, transverse bands laterally of width equal to one-third to one-half length of tergite towards anterior margin of tergites 6, 7, 8 and 9; red pigment granules isolated or aggregated in clusters within all the brown areas, absent elsewhere. Underside more glossy buff; mouth parts more reddish; red pigment granules absent. Individuals vary in the strength of the pigmentation, particularly on head and thorax, but at low magnifications the transverse brown bar on tergites 3–5 and the four transverse bands laterally on the more posterior tergites are always evident.

Sculpturing: as female.

Head: with fine hairs uniformly scattered, length of hairs (0·016 mm.) almost three times width of adjacent spindle-shaped areas on cuticle, distance between hairs equal to or slightly less than length of hairs. Eye with 5 ommatidia—in 20 individuals 100% with 5 ommatidia.

Thorax: with fine hairs uniformly scattered; with 3–4 stronger and longer bristles, truncated distally, on lateral lobe of pronotum on each side, one on lateral tip ("humeral seta"), the others shorter and thinner and, with humeral seta, forming a transverse row towards anterior margin, with 1–4 small fine hairs more posteriorly near humeral seta. Prothoracic sternite with 3–5 bristles anteriorly arranged in a transverse arched row—in 50 specimens 4% with 3 bristles, 86% with 4, 10% with 5. Meso-metathoracic sternite with transverse slightly arched row of 6–8 bristles towards anterior margin—in 50 specimens 22% with 6 bristles, 70% with 7, 8% with 8.

Abdomen: with short fine hairs uniformly scattered, average length of these hairs (on tergites 3–7) 0·010 mm.; with long strong bristles, truncated distally and dilated apically, on 9th and 10th tergites laterally, on epiproct, paraprocts and subgenital plate; three such bristles on each side of almost equal length and longer than the adjacent bristles, one of these on lateral margin of 9th tergite and two on lateral margin of 10th tergite, the bristle

measured (Table 2) being the one more dorsally situated of the pair on the 10th tergite. Towards the base of epiproct on each side of mid line a bristle (Table 2), truncated distally, much longer than adjacent bristles on epiproct but shorter than the two bristles on 10th tergite laterally. Tergites 1 and 2 each divided into two transverse bands interrupted medially, width of three anterior bands subequal, the posterior band of segment 2 almost twice width of each of the more anterior bands. Remaining tergites uniformly sclerotised.

Body length 0·86—0·96 mm. (20 measurements). Various body measurements are given in Table 2.

Liposcelis entomophilus is most closely related to *L. luridus* Broadhead. The two species are very similar in ground colour, the chaetotaxy of the sternites, the number of sclerites on abdominal tergites 1 and 2 and in the sculpturing of the abdominal tergites. The sculpturing of the head dorsally is similar in the presence of arched ridges enclosing spindle-shaped areas, but in balsam mounts of stained cuticle the tubercles within these areas are distinct in *luridus* and very indistinct in *entomophilus*. The latter species differs markedly from *luridus* in the brown transverse markings on the abdominal tergites, in the chaetotaxy of the lateral lobes of the pronotum, in the distance between the hairs on the vertex of the head (in females, 0·015 mm. in *entomophilus*, 0·033 mm. in *luridus*) and in the larger size. All six linear measurements given in Tables 1 and 2 except for the length of the 4th antennal segment are significantly larger than those of *luridus*, there being no overlap between extreme measurements in the lengths of the humeral seta and of the bristle on the epiproct. *L. entomophilus* is identical with *pubescens* Broadhead in the chaetotaxy of the lateral lobes of the pronotum.

TABLE 2.

Liposcelis entomophilus (Enderlein). ♂, linear measurements.

	Number measured	Mean (mm.)	Standard deviation	Extremes	
Width of head capsule ...	35	0·210	0·003	0·202	0·219
Length of 4th antennal segment	25	0·063	0·003	0·057	0·068
Greatest width of hind femur	40	0·128	0·006	0·112	0·139
Length of humeral seta ...	39	0·036	0·002	0·029	0·041
Length of longest apical abdominal bristle	28	0·070	0·002	0·066	0·075
Length of bristle on epiproct	28	0·054	0·003	0·049	0·060

Measurements of the type specimens (females) of *entomophilus*, *bakeri* and *virgulatus* are given in Table 3. All these measurements lie within the range of extreme measurements for the species as shown in Table 1. Moreover the sculpturing, colour, number of ommatidia, the chaetotaxy of the lateral lobes of the pronotum and of the thoracic sternites are also

identical in the three types or fall within the range of variation indicated in the description given. *Bakeri* and *virgulatus* therefore fall as synonyms of *entomophilus*.

The species has obviously become very widely distributed by commerce, but there is no indication from the literature of its natural habitat.

TABLE 3

Linear measurements in mm. of the type specimens (♀) of *Liposcelis entomophilus*, *bakeri* and *virgulatus*.

	L. entomophilus	*L. bakeri*	*L. virgulatus*
Width of head capsule	0·294	0·303	0·299
Length of 4th antennal segment ...	0·071	0·079	0·083
Greatest width of hind femur ...	0·172	0·201	0·185
Length of humeral seta	0·045	0·050	0·047
Length of longest apical abdominal bristle	—	—	0·078
Length of bristle on epiproct ...	0·059	0·063	—
Length of hairs on vertex of head ...	0·017	0·018	—
Distance between hairs on vertex of head	0·014	0·016	—
Length of hairs on abdominal tergites 3–7	0·011	0·012	0·011

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NEW SPECIES OF STAPHYLINIDAE (COL.) FROM MAURITIUS

By Malcolm Cameron, M.B., R.N., F.R.E.S.

Lispinus specialis sp. n.[1]

Moderately shining; black, the apex of the last tergite and elytra dark red. Antennae black, the first five segments and legs reddish-yellow. Length 4 mm.

In build somewhat like *propinquus* Cameron but in all other respects different. Subconvex; head without impressions, truncate in front, narrower than the thorax, closely covered with small umbilicate punctures and with transverse striate ground sculpture. Antennae with the 2nd and 3rd segments of equal length, 4th to 6th a little longer than broad, 7th as long as broad, 8th to 10th slightly transverse. Thorax convex, slightly transverse (2·4 : 2), the sides gently rounded in front, behind the middle straight and retracted to base, along the middle with very narrow impunctate line, at the posterior angle with a small obsolete impression, the puncturation as on the head and with longitudinal striate ground sculpture. Elytra longer than thorax (2·5 : 2), as long as broad, the puncturation and ground sculpture as on the thorax. Abdomen with the first four visible tergites each with a sparingly punctured, almost smooth space at the middle posteriorly, elsewhere nearly impunctate and strongly coriaceous.

Mauritius: Mt. Cocotte, 6.ii.43 (*J. Vinson*).

Palaminus montanus sp. n.

Shining; fore-parts dark reddish-brown, abdomen black. Legs reddish-yellow. Length 4·5 mm.

Differs from *madecassa* Fauvel in the darker colour of the fore-parts, black abdomen, larger eyes, shorter more transverse (2·5 : 2) and convex thorax with the sides less retracted posteriorly: the punctures of the same calibre on the head and thorax as in *madecassa* but closer, those of the elytra a little coarser.

Mauritius: Mt. Cocotte, 6.ii.43 (*J. Vinson*). Unique.

Paederus rubidus sp. n.

Shining, entirely yellowish-red. Length 7-8 mm.

Head hexagonal, a little broader than the thorax, eyes much shorter than the postocular region, the vertex impunctate, elsewhere with a few small scattered punctures. Antennae long, all the segments longer than broad. Thorax longer than broad (5 : 4), oval, more retracted in front than behind, on each side of middle with an irregular row of 8 or 9 larger and smaller punctures, at the sides with more numerous but similar ones. Elytra a little shorter (4·5 : 5) than the thorax, widened behind, as long as broad, coarsely and rather closely punctured. Abdomen a little narrowed at the base, widest at the 4th visible tergite then narrowed to apex, at the bases of the anterior segments with rather close but smaller punctures than on the elytra, elsewhere with smaller scattered ones. Ground sculpture entirely absent. Pubescence scanty.

♂. 6th sternite with narrow deep parallel sided excision, the apex rounded.

Mauritius: Bassin Blanc, 11.xii.39. (*J. Vinson.*)

Astenus distinctus sp. n.

Slender, moderately shining, the head black, the rest yellowish-red, the elytra with oval black spot postero-externally, not extending to the shoulder or the posterior margin, the

[1] The types of the species are in the British Museum (Natural History).

abdomen with the last two tergites black. Antennae and legs reddish-yellow. Length 4 mm.

In size and build much like *fauveli* Epp. but differently colored and with rather narrower thorax. Head subquadrate, slightly longer than broad, broader than the thorax, the postocular region slightly rounded and slightly retracted, with rather small close umbilicate punctures much as in *fauveli*, the antennae slender as in that species but a little shorter, the penultimate segments a little longer than broad. Thorax longer than broad (2 : 1·5), the sides rounded in front, straight and retracted behind, the sculpture as on the head. Elytra slightly longer than the thorax, slightly longer than broad, closely, moderately finely punctured. Abdomen a little enlarged posteriorly, finely and closely punctured, less closely on the last two tergites.

MAURITIUS : Réduit, 4.viii.36. (*J. Vinson.*) Unique.

Medon (s. str.) **vinsoni** sp. n.

Shining light red. Antennae and legs reddish-yellow. Length 3 mm.

Colour and lustre of *immsi* Bernhauer but much smaller, the head less transverse and less finely punctured, the eyes much smaller. Head subquadrate, slightly transverse, as broad as the thorax, the eyes very small, the post-ocular region very slightly widened, the posterior angles rounded, the vertex, base and front practically impunctate, elsewhere with small, rather close umbilicate punctures. Antennae with the 3rd segment slightly longer than 2nd, 4th to 6th slightly longer than broad, decreasing in length, 7th to 10th slightly transverse. Thorax slightly transverse, trapezoidal, narrowly impunctate along the middle, elsewhere with close punctures, much more superficial and rather smaller than on the head. Elytra as long and as broad as the thorax, with fine close somewhat asperate puncturation. Abdomen finely, moderately, closely punctured and with fine obsolete ground sculpture. Fore-parts without ground sculpture.

♂. 6th sternite with broad deep arcuate excision in the posterior margin.

MAURITIUS : Mt. Cocotte, 30.xii.39. (*J. Vinson.*)

Cryptobium morosum sp. n.

Black, moderately shining, the posterior margins of the 7th and 8th tergites narrowly and obscurely reddish. Antennae reddish-yellow, the apex of the 1st and 3rd and 4th segments infuscate. Palpi and legs yellow. Length 6 mm.

Head a little longer than broad (4 : 3·3), broader than the thorax, the sides behind the eyes very slightly rounded and widened, the posterior angles broadly rounded, closely covered with small umbilicate punctures. Antennae with the 3rd segment a little longer than the 2nd, 4th to 7th longer than broad, decreasing in length, 8th as long as broad, 9th and 10th slightly transverse. Thorax cylindrical, longer than broad, the sides feebly rounded in front, straight and slightly retracted behind, along the middle with narrow impunctate area, elsewhere with sculpture as on the head. Elytra longer (4·5 : 4) and broader than the thorax, the sculpture very similar. Abdomen closely and rather finely punctured throughout. The whole insect without ground sculpture and sparingly pubescent.

♂. 5th sternite with large oval fovea furnished with long close pubescence, its posterior margin broadly and feebly emarginate : 6th sternite with narrower and deeper arcuate emargination.

MAURITIUS : Riv. St. Louis, 11.v.46 (Type). Pailles, xi.38. (*J. Vinson.*)

Xantholinus (s. str.) **vinsoni** sp. n.

Shining black, the elytra and raised lateral and posterior margins of the tergites yellowish-red, the 8th tergite yellow. Antennae and legs reddish-yellow. Length 5·5 mm.

Head quadrate, a little longer than broad, broader than the thorax, the posterior angles

rounded: median frontal sulci fine but distinct; the punctures small, scanty and umbilicate; ground sculpture fine, transverse, wavy. Antennae with the 4th to 10th segments moderately transverse. Thorax longer than broad (3·5 : 2·5), the sides straight and retracted behind, with dorsal row of 10 or 11 punctures, externally with two other rows, the inner of four, the external of six punctures, the ground sculpture as on the head but rather finer. Elytra as long as the thorax, the three rows of punctures small and superficial; ground sculpture absent. Abdomen finely and very sparingly punctured, the ground sculpture transverse.

MAURITIUS: Mt. Cocotte, 11.xii.43. (*J. Vinson.*)

Philonthus (Gabrius) vinsoni sp. n.

Shining black, the thorax reddish-brown with dorsal row of six punctures. Antennae and legs yellow. Length 2·5 mm.

Readily recognised by the small size, yellow antennae and short elytra. Head quadrate, as long as broad, almost as broad as the thorax, the eyes very small, the temples long, median interocular punctures widely separated, the disc with four quadrately placed punctures, at the sides with a few others; ground sculpture absent. Antennae rather short, 3rd segment as long as but narrower than 2nd, 4th slightly longer than broad, 5th as long as broad, 6th to 10th transverse, slightly increasing in width. Thorax very slightly longer than broad, sides straight, slightly retracted to the base, external to the dorsal series with a row of 3 or 4 punctures: ground sculpture absent. Elytra shorter than the thorax (3 : 3·5), broader than long, with a few very small obsolete punctures and without ground sculpture. Abdomen finely, by no means closely punctured, the pubescence rather long and ground sculpture finely coriaceous.

MAURITIUS: Mt. Cocotte, 6.ii.43. (*J. Vinson.*) Unique.

Conosoma fraternum sp. n.

Shining black, the elytra with somewhat crescentic ill-defined red basal marking, the posterior margins of the tergites narrowly rufescent. Antennae black, the first four segments and legs reddish-yellow. Length 2·5 mm. (abdomen somewhat retracted).

Build of *binotatum* Gravenhorst, the coloration of the fore-parts similar, the antennae similarly constructed but more slender, the puncturation of the head and thorax not quite so fine and the ground sculpture more evident, that of the elytra and abdomen scarcely differing from that of *binotatum*, but the abdomen, except for the narrowly refescent posterior margins of the tergites, entirely black.

MAURITIUS: Makaté Forest, 8.iii.41. (*J. Vinson.*) Unique.

Conosoma separatum sp. n.

Shining yellowish-red, the abdomen black, the posterior margins of the tergites broadly rufescent, the 7th yellow. Antennae black, the first four segments and legs reddish-yellow. Length 3 mm. (abdomen somewhat retracted).

Head with a few very fine scattered punctures and fine transverse ground sculpture. Antennae as in *immaculatum* Stephens. Thorax transverse (3·5 : 2·5), the puncturation very fine and by no means close, the ground sculpture as on the head. Elytra longer than the thorax (3 : 2·5), broader than long (3·5 : 3), the puncturation fine, moderately close, the ground sculpture feeble. Abdomen very finely, rather closely punctured on the anterior segments; some sparingly behind; ground sculpture transverse, striate.

LA RÉUNION: Salazie, 28.ii.35. (*J. Vinson.*) Unique.

Var. *aberrans* var. n.

11th segment of antennae yellow.

MAURITIUS: Mt. Cocotte, 6.ii.43. (*J. Vinson.*) Unique.

Conosoma alienum sp. n.

Black, shining, the base of elytra with narrow transverse reddish-yellow marking not extending to the scutellum, the posterior margins of the tergites rufescent. Antennae black, the first three segments and legs reddish-yellow. Length 3½–4 mm.

Very near *littoreum* L., of similar build, the antennae similarly constructed but differently coloured, the puncturation not so fine or close, the ground sculpture less distinct, the reddish marking at base of elytra less diffuse and limited to the base, somewhat crescentic in shape.

MAURITIUS : Mt. Cocotte, 24.i.42. (*Ray. Mamet*, Type), 8.vi.43. (*J. Vinson.*)

Maresia gen. n.

Near *Anebolura* and *Paracyphea* Bernhauer but differing in the structure of the antennae and very different sculpture, from *Anebolura* also by the tongue only briefly split at apex and the shorter 4th segment of the maxillary palpi and from *Paracyphea* in the thorax being narrower than the elytra and the longer tongue which extends to about the level of the middle of the 3rd segment of the labial palpus. Head narrower than thorax, neck stout, temples finely bordered below ; labrum transverse, the anterior border gently rounded. Maxillary palpi with the 3rd segment a little shorter than 2nd and broader at apex, 4th subulate, longer than half the preceding. Labial palpi distinctly 3-segmented, the 1st segment short cylindrical, 2nd about half as long, 3rd much longer and narrower, fully as long as the 1st and 2nd together. Frontal epipleura visible from side. Mesosternum not carinate, its process triangular, briefly rounded at apex, extending nearly the whole length of the coxae and separated by a short piece from the pointed metasternal process, the coxae moderately separated. Elytra slightly emarginate postero-externally. Anterior and middle tarsi with the first three segments short and subequal, the 4th longer than the preceding together, posterior with the first four segments short and subequal. Abdomen with the first three visible tergites transversely impressed at their bases.

Maresia grossepunctata sp. n.

Black, shining. Antennae and legs black, the tarsi brownish-yellow. Length 2 mm.

In build much like a *Leptusa* s. str. Head subquadrate, narrower than the thorax, eyes small, much shorter than the temples, closely and very coarsely punctured. Antennae with the 3rd segment slightly shorter than 2nd, 4th and 5th scarcely longer than broad, 6th to 10th gradually more transverse, the penultimate twice as broad as long, 11th stouter, pointed. Thorax transverse (2·5 : 2) convex, the sides gently rounded in front, straight and retracted behind, the posterior angles obtuse, the sculpture as on the head. Elytra longer (2·75 : 2) and broader than the thorax, broader than long (3·4 : 2·75) with similar but not quite so close sculpture. Abdomen parallel, distinctly coriaceous, closely sculptured in the impressions, almost impunctate elsewhere, the 7th tergite with a few small granules along the posterior margin. Fore parts with a finer coriaceous ground sculpture than on the abdomen ; pubescence short, white and scanty.

MAURITIUS : Les Mares, 7.v.38 (Type) ; Mt. Cocotte, 11.xii.44. (*J. Vinson.*)

Leptusa (s. str.) **minuta** sp. n.

Pitchy black, moderately shining. Antennae and legs reddish-yellow. Length 1·3 mm.

Colour of *fumida* Erichson but more shining and much smaller, the head finely but more closely and distinctly punctured but without distinct ground sculpture ; antennae of similar structure but more slender. Thorax transverse (2·5 : 2), more shining, very finely, but closely and more distinctly punctured, without ground sculpture. Elytra longer than the thorax (2·5 : 2), more closely and more finely punctured than in *fumida* and without ground sculpture. Abdomen parallel, finely and sparingly punctured especially behind, finely coriaceous.

♂. 3rd tergite with minute tubercle at the middle of the posterior margin : 7th with two rows of small granules before the posterior margin : 8th broadly rounded and finely crenulate.

MAURITIUS : Forest Side, 12.i.35. (*J. Vinson.*) Unique.

Heterota vinsoni sp. n.

Pitchy black, moderately shining, the elytra extensively brownish-yellow, the scutellary region and sides pitchy. Antennae blackish, the first two segments, palpi and legs reddish-yellow. Length 2·5 mm.

Very near *pictipennis* Fauvel but a little larger, not so black, the antennae darker, the light colour of the elytra more extensive and brownish-yellow, thorax with the puncturation very fine but closer and more evident, that of the head also ; ground sculpture of the elytra finer : abdomen more shining, the ground sculpture weaker.

♂. 7th tergite with numerous small granules on the posterior half : 8th truncate, on each side with a small tooth, the margin between closely and finely denticulate, the upper surface with scattered granules.

MAURITIUS : Roches Noires, under seaweed, 20.xi.1945. (*J. Vinson.*)

Brachyusa minor sp. n.

Black, greasy lustrous, the posterior margin of the elytra narrowly yellow. Antennae black, the 11th segment reddish-yellow. Legs yellow, the femora and tibiae more or less infuscate. Length 1·75 mm.

Colour, build and lustre of *raptoria* Wollaston, but smaller, the antennae shorter and stouter, thorax shorter, transverse (3 : 2·75), the sculpture and pubescence in both species scarcely differing. Antennae with the intermediate segments shorter.

MAURITIUS : Pailles, xi.1938. (*J. Vinson.*) Unique.

Pseudomyrmedon gen. n.

In build somewhat resembling *Blepharrhymenus* Solier but with stouter neck and in all other respects different. Systematically its position is with the SCHISTOGENIAE. Head free, exserted, the neck broad, the temples bordered below. Labrum transverse, semicircular. Mandibles slender, edentate. Maxillary palpi with the 3rd segment as long as, but a little thicker apically than, the 2nd, 4th subulate, half as long as the 3rd. Inner lobe of maxilla corneous, internally with small close teeth along the apical half, posteriorly with longer setae : outer lobe somewhat longer, the apex with fine hairs. Mentum transverse, trapezoidal, deeply and broadly emarginate in front, the anterior angles prominent. Labial palpi long styliform, of two segments, the 2nd only a little shorter than the 1st. Tongue small, lanceolate, about a third as long as the 1st segment of the labial palpus and briefly split at apex. Pronotal epipleura visible from the side. Prosternum keeled apically, the side margins raised. Mesosternum punctured at the base and with a short obsolete keel, elsewhere smooth, the triangular apical part separated by a transverse ridge and keeled along the middle and with the side margins elevated ; coxae narrowly separated. Metasternum with briefly rounded apex separated from the mesosternum by a short intersternal piece. Elytra emarginate postero-externally. Abdomen parallel, the first three visible segments transversely impressed at the bases. Tibiae pubescent. Tarsi 4, 5, 5, the anterior with the first three segments short and subequal, the 4th longer than the preceding together middle with the first four segments short, subequal, 5th fully as long as the preceding together : posterior with first three segments rather short, equal, 4th a little shorter, 5th almost as long as the preceding together.

Type *Pseudomyrmedon alienus* sp.n.

Pseudomyrmedon alienus sp. n.

Shining black, the elytra in the sutural region with ill-defined reddish tinge, the posterior margins of the tergites narrowly rufescent. Antennae black, the first four segments, palpi and legs reddish-yellow. Length 4 mm.

Head round, narrower than the thorax, the eye about as long as the post-ocular region, impunctate along the middle of the front, elsewhere with close, rather large umbilicate punctures. Antennae stout, the 2nd segment slightly shorter than the 3rd, 4th a little longer than broad, 5th as long as broad, 6th to 10th transverse, gradually increasing in width, the penultimate twice as broad as long. Thorax as long as broad, the sides rounded in front, straightly retracted behind, the posterior angles obtuse, the sculpture as on the head. Elytra broader and a little longer than the thorax (2·75 : 2), broader than long, convex, the sculpture similar. Abdomen a little narrowed towards apex, the first three visible tergites transversely impressed at their bases and there closely and rather coarsely punctured, elsewhere nearly impunctate. The fore-parts without, the abdomen with a very feeble transverse ground sculpture. The pubescence throughout rather long but not very close.

MAURITIUS : Bassin Blanc, 11.xii.1939 (Type). Mt. Cocotte, 27.xii.41. (*J. Vinson.*)

BOOK NOTICE.

The mosquitoes of the Southern United States east of Oklahoma and Texas. By S. J. Carpenter, W. V. Middlekauf and R. W. Chamberlain. 8vo. Notre Dame, Indiana (American Midland Naturalist), 1946. Pp. [viii] +292, text illust.

This work forms Monograph No. 3 of the *American Midland Naturalist Series*. In it an attempt has been made to give an up-to-date account of the mosquitoes of the region.

The bionomics of the insects and their relation to disease are first dealt with, and then the authors cover in some detail the technique of collecting and rearing, storing, and mounting larvae and adults for use in the laboratory.

Useful hints are given for the identification of mosquitoes and the characters used in identifying the insect at various stages are discussed.

The species are then treated individually, and in each case a description of the adult female, adult male, larva, distribution and bionomics is given.

A bibliography of nearly 200 titles, and an index, complete the work.

TIPULA GIMMERTHALI LACKSCHEWITZ (DIPTERA, TIPULIDAE) NEW TO BRITAIN

By E. S. Brown, B.A., F.R.E.S.

In late October and early November, 1945, a species of *Tipula* was found in the Pentland Hills, near Edinburgh (Midlothian), which cannot be identified with any British species. The females are subapterous, and the only British *Tipula* known hitherto in this condition is *T. pagana* Meigen, from which the male is clearly distinct since it has faintly marmorated wings, these being quite unmarked in *pagana*.

In Audcent's key (1932) the male runs to either *Tipula irrorata* Macquart or to a couplet containing *T. unca* Wiedemann and *T. macrocera* Zetterstedt. The new insect can be separated from *irrorata*, however, by a difference in the hypopygium, for its inner clasper is not turned down apically as in that species; also the median praescutal stripes, although they approach one another very closely, do not unite in the male, although they do so in the female; this last character is, however, somewhat variable. As regards the other two species, the hypopygium is small and quite different from that of *unca*, from which there are differences also in wing-shape and colour: and from both *unca* and *macrocera* it differs in antennal length, which in the male is equal to, but not greater than that of the thorax and head (with proboscis).

Specimens of this *Tipula* were sent to the British Museum (N.H.) for determination, and Mr. R. L. Coe has kindly identified them as *Tipula gimmerthali* Lackschewitz (1925), a species described from Latvia, and since recorded by the same author (1936) from Russian Lapland and the Samojeden-Tundra of North Russia.

Separation from allied British Species.

The female, owing to its subapterous condition, can only be confused with one other British species, namely *Tipula pagana* Meigen. The following characters will distinguish the two :—

	T. gimmerthali ♀	*T. pagana* ♀
Praescutal stripes	Three well-defined brown stripes (the two median ones being fused).	One ill-defined brown stripe, sometimes indistinctly divided into two. (The two lateral stripes are almost or quite absent).
Basal segment of antenna	Darker	Paler, more heavily grey-dusted.
General colour of body and legs	Darker, especially the thorax	Paler.
Wings	More or less rounded and broadened at tip (fig. 1)	More or less pointed at tip, with pre-apical prominence on costal margin (fig. 1).

Determination of the fully-winged male is more difficult. Most specimens have the wings at least faintly marmorated, but in recently hatched examples the markings are very indistinct. Assuming that the specimen is mature, however, the hypopygial character mentioned above separates it sufficiently easily from *T. irrorata*, and the only species with which it can be easily confused is *T. macrocera*. Mr. R. L. Coe, who has examined some of the Scottish specimens, has drawn up for their separation the following couplet, which he has very kindly allowed me to reproduce here :—

Male antenna with basal segment of flagellum longer than scape and pedicel together ; genitalia dark reddish, outer claspers broad, finger-shaped, inner claspers pointed at tip, rather narrow at base. Female normal . . . . . *macrocera* Zetterstedt

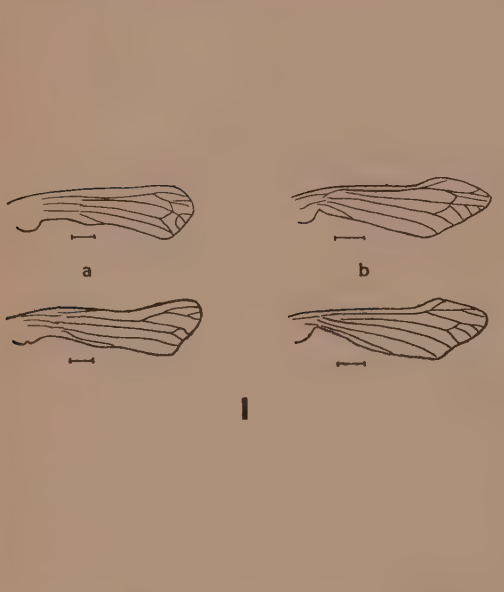
Male antennae with basal segment of flagellum shorter than scape and pedicel together ; genitalia yellowish, outer claspers narrow at base. Female micropterous . . *gimmerthali* Lackschewitz

These characters should generally be sufficient for separation, but examination of a longer series has brought to light one or two further distinctions, and it may be worth while to draw up a complete list of differences as follows :—

	T. gimmerthali ♂	*T. macrocera* ♂
Antennae	Basal segment of flagellum shorter than scape and pedicel together. Total length of antennae equal to that of thorax and head (with proboscis).	Basal segment of flagellum longer than scape and pedicel together. Total length of antennae considerably greater than that of thorax and head (with proboscis).
Median praescutal stripes	Each stripe widens all the way from hind to front end	Each stripe parallel-sided, or even convergent, for a short distance at the front end.
Outer clasper ...	Narrow at base, where there is a heavily chitinised tooth (normally visible only after dissection) (fig. 2*a*).	Broader, finger-shaped, not narrowed at base (fig. 2*a*).
Inner clasper ...	Broader at base, with a flat lateral extension of the lower and hind borders producing a concave outer face (fig. 2*b*).	Narrower at base, with emarginate hind border (fig. 2*b*).
Two teeth on hind border of 9th tergite	Sharply pointed, placed more medially and turned downwards at tip (fig. 2*c* and *d*)	Blunt, placed more laterally and turned slightly upwards at tip (fig. 2*c* and *d*).

It should be mentioned that the male genitalia of the Scottish specimens agree in the main with the figures given by Lackschewitz in his original description (1925), but the tooth on the outer clasper is

larger than in his figure, and there is a slight difference in the inner clasper. The outer clasper agrees perfectly with a figure by Lackschewitz in his later paper (1936), however, presumably modified after he had examined more material. The slight difference in the inner clasper still remains, but this organ has a peculiar twisted form, and its appearance alters much with but slight variation in the angle from which it is viewed. There is no doubt that the Scottish and continental insects are conspecific, any slight discrepancies being attributable to the discontinuous geographical distribution.



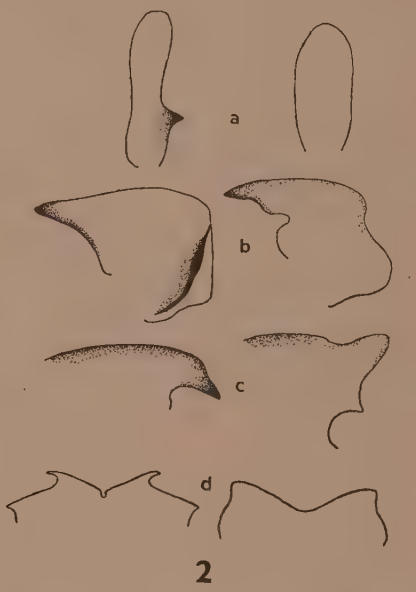


Fig. 1.—Wings of two specimens of (*a*) *Tipula gimmerthali* female, and (*b*) *Tipula pagana* female.

Fig. 2.—Left, *Tipula gimmerthali* male. Right, *Tipula macrocera* male. (*a*) Outer clasper. (*b*) Inner clasper, lateral view. (*c*) Ninth tergite, lateral view. (*d*) Ninth tergite, dorsal view.

(The chaetotaxy has been omitted in these diagrams.)

Habitat and Geographical Distribution.

The Scottish specimens were found in a very restricted locality at 900–1,000 feet in the Pentland Hills near Milton Bridge (Midlothian), a few miles south of Edinburgh. The colony extended along a small burn flowing down a little steep-sided valley in treeless grassy heath; the banks of the stream were slightly boggy, with growth of *Juncus* here and there. The Tipulidae were apparently restricted to within a few yards of the stream, and although numerous over a stretch of about a hundred yards, none could be found either above or below these limits, although there appeared to be no difference at all in the neighbouring terrain except in point of altitude.

At a higher altitude there was a fairly strong colony of *Tipula pagana*,

which made contact with the *T. gimmerthali* colony below it, and two or three *T. czizeki* de Jong were found with the *pagana*.

The first *T. gimmerthali* (a male) was found on 10th October; on the 12th they were common, and 14 males and 4 females were caught; two days later they were still numerous, and two pairs were found mating. The apparent scarcity of females was doubtless in part due to their being confined to the ground by their subapterous condition. The last specimen taken was a single male, on 4th November. On all these days *T. pagana* was on the wing also; it was a strange coincidence that the only two known British species of this large genus with subapterous females, and both of them among the latest to appear in the year, should be such close neighbours. *T. gimmerthali* is undoubtedly a very late species, for I failed to find it on several previous occasions when I visited the same ground; Lackschewitz had much the same experience, but although the Latvian records are for late September and early October, it is interesting to note that specimens from Russian Lapland and northern Russia, both localities above 65° N. latitude, were taken earlier, in the middle of August and the middle of September.

The distribution of this species as now known—Scotland and the north European localities mentioned above—provides an interesting instance of discontinuity. Colonisation of one locality from the other by migration is out of the question, owing to the flightless condition of the female. The only two reasonable explanations of this distribution therefore seem to be (*a*) transmission of the insect from one of the localities to another by human agency, or (*b*) the extermination of the species during the ice age, or since, except in isolated areas where it has survived as a "glacial relic." There is some evidence that insects survived the ice age in latitudes equally far or farther north (Brown, 1944 and 1945,) and the latter alternative must not therefore be regarded as beyond the bounds of possibility. If *T. gimmerthali* should later be discovered in other isolated stations, more light may be thrown on the problem.

I should like to express my gratitude to Mr. R. L. Coe, of the British Museum, for the identification of *Tipula gimmerthali*, and also for permission to reproduce a portion of his key to the genus *Tipula* in advance of its publication.

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MAYFLIES (EPHEMEROPTERA) COLLECTED BY J. OMER-COOPER IN THE EASTERN CAPE PROVINCE, SOUTH AFRICA, WITH A DESCRIPTION OF A NEW GENUS AND SPECIES (*NOTONURUS COOPERI*)

By R. S. Crass, B.Sc.

I am indebted to Professor J. Omer-Cooper, of Rhodes University College, Grahamstown, for the opportunity to examine material collected by him from three localities in the Eastern Cape Province. This region presents features of special zoogeographical interest owing to its position as a meeting-ground for the fauna of Eastern Africa and that of the South-west Cape. No systematic work has, however, been done on the mayflies of the Eastern Cape, and records are the result of sporadic collecting only. The paucity of perennial streams over much of the area restricts aquatic life, but ranges such as the Hogsback and Katberg, which rise to an altitude of 6,000 feet, and lower hills like those on which lies the Pirie Forest provide exceptions. The abundant streams of these mountain areas have already been shown to possess a rich insect fauna, and an extensive field awaits future investigation. The mountainous country of East Griqualand and Pondoland, which extends to the Natal border, is transversed by many fine rivers whose fauna has scarcely been studied.

Eaton (1884) described one mayfly (*Adenophlebia auriculata*) from Grahamstown, Barnard (1932) added the record of a second species from the Eastern Cape, and Crass (1946) brought the total to twenty-two.

The material described below comprises ten species, nine of which are known, while the tenth is new and belongs to a new genus for which I propose the name *Notonurus*.

It is of interest to note the distribution, so far as it is known, of the twenty-three Eastern Cape mayflies : eight also occur in Natal, four are South-west Cape forms, ten are widespread species known to extend from the South-west Cape to Natal, and one is peculiar to the area under consideration.

Baetidae.

Cloëon aeneum Barnard.

Barnard, 1932 : 216, fig. 7.

Locality.—Kasouga River, February, 1944 (*J. Omer-Cooper*). One ♀ (identification not certain).

Previous Records.—South-west Cape—Groot Drakenstein (*A. C. Harrison*) ; Jonkershoek, Stellenbosch (*H. G. Wood*) ; Lilyfontein, Kamiesberg (*K. H. Barnard*) ; Eastern Cape—Grahamstown (*Albany Museum*) ; all *teste* Barnard.

Austrocloëon africanum (Esben-Petersen).

Esben-Petersen, 1913 : 184, fig. 8. Barnard, 1932 : 217, figs. 8 and 9. Crass, 1946 : 57.

Locality. — Hogsback, near Alice, Kingwilliamstown Division, February, 1944 (*J. Omer-Cooper*). One ♂.

Previous Records.—Zululand (*W. E. Jones*); Kimberley (*J. H. Power*); Grahamstown (*Miss Walton*); Pilgrims Rest, Transvaal (*Schunke*); Sabi, Transvaal (*J. C. Dendy*); Winkle Spruit, Natal (*Natal Museum*); Groot Drakenstein and Worcester (*A. C. Harrison*) and Ceres (*R. M. Lightfoot*) in the South-west Cape; all *teste* Barnard. Grahamstown (*J. Omer-Cooper*); Nelspoort and Cradock, in the Karroo (*R. S. Crass*); Curry's Post, Natal (*R. S. Crass*).

Brachycercidae.

Austrocaenis capensis Barnard.

Barnard, 1932 : 227, figs. 17 and 18. Crass, 1946 : 93.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). One ♂, one ♀.

Previous Records.—Lakeside, Cape Peninsula (*K. H. Barnard*); Stellenbosch (*A. C. Harrison*); numerous other localities in the South-west Cape, *teste* Barnard; Kasouga River (*G. B. Hudson*), Grahamstown (*R. S. Crass*), Amatola Mts. (*R. S. Crass*), all in the Eastern Cape; streams throughout the Natal midlands, and in the Drakensberg foothills (*R. S. Crass*).

Leptophlebiidae.

Aprionyx natalica (Lestage).

Lestage, 1924 : 325. Barnard, 1932 : 240. Crass, 1946 : 96, fig. 34.

Localities.—Hogsback, near Alice, February, 1942, and Pirie Forest, February, 1944 (*J. Omer-Cooper*). Numerous ♂ and a few ♀.

Previous Records.—Kranskop, Natal (*K. H. Barnard*); Katberg and Hogsback (*Albany Museum*), *teste* Barnard; Curry's Post, Dargle and Inzinga districts, Natal (*R. S. Crass*).

Adenophlebia auriculata Eaton.

Eaton, 1884 : 112, pl. XIII, fig. 21. Barnard, 1932 : 242, fig. 30. Crass, 1946 : 100.

Locality.—Hogsback, near Alice, February, 1942 (*J. Omer-Cooper*). Two ♀.

Previous Records.—Grahamstown (*Albany Museum*), *teste* Eaton; Barberton, Transvaal (*South African Museum*); Natal (*S. G. Rich*), *teste* Barnard; Woest Hill, Grahamstown (*C. H. Crass*); Pirie Forest (*R. S. Crass*); Kokstad, East Griqualand (*R. S. Crass*); Basutoland, 10,000 feet (*K. M. Pennington*); Mont-aux-Sources summit, Natal (*R. F. Lawrence*); streams throughout the Natal midlands and Drakensberg foothills (*R. S. Crass*).

Adenophlebia sylvatica Crass.

Crass, 1946 : 102, figs. 35 and 36.

Locality.—Hogsback, near Alice, February, 1942 (*J. Omer-Cooper*). One ♂.

Previous Records.—Hogsback (*R. S. Crass*); Fenfield, Amatola Mts. (*A. Perks*); forest streams in Curry's Post and Karkloof districts, Natal (*R. S. Crass*).

Choroterpes nigrescens Barnard.

Barnard, 1932 : 248, figs. 38 and 39. Crass, 1946 : 108.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). One ♂.

Previous Records.—Groot Drakenstein (*A. C. Harrison*), Rawsonville (*A. C. Harrison*), Potteberg (*A. T. Packham*), all in South-west Cape, *teste* Barnard ; Fenfield, Amatola Mts., Eastern Cape (*R. S. Crass*).

Euthraulus elegans Barnard.

Barnard, 1932 : 249, figs. 40 and 41. Crass, 1946 : 102.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). One ♂, four ♀.

Previous Records.—Groot Drakenstein (*A. C. Harrison*), Stellenbosch (*A. C. Harrison*), Hex River (*A. C. Harrison*), Cedarbergen (*K. H. Barnard*), all in South-west Cape, *teste* Barnard ; Kokstad, East Griqualand (*R. S. Crass*) ; streams throughout the Natal midlands and Drakensberg foothills (*R. S. Crass*).

ECDYONURIDAE.

Afronurus peringueyi (Esben-Petersen).

Esben-Petersen, 1913 : 185, figs. 9–12. Barnard, 1932 : 255, figs. 45–47. Crass, 1946 : 109.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). Two ♂ (subimagos), four ♀ (subimagos, identification uncertain).

Previous Records.—Zululand (*W. E. Jones*), *teste* Esben-Petersen ; Kunene River, Ovamboland (*K. H. Barnard*) ; Natal (*L. A. Day*), *teste* Barnard ; Amatola Mts. and East Griqualand (*R. S. Crass*) ; streams throughout the Natal midlands and Drakensberg foothills (*R. S. Crass*).

Notonurus gen. n.

Imago.—Cross-veins numerous in both fore- and hind-wings. Hind-wing broadly ovate, MA forked. Hind tarsus of male less than the length of the tibia ; first joint of hind tarsus of male equal to second joint ; first joint fore tarsus shorter than second.

Forceps of male four-jointed, second joint longer than the others together. Penes united, flattened and expanded distally, with an apical incision ; outer and inner lobes on each side distally, and a median ventral spiniferous projection.

Nymph.—Unknown.

Genotype.—*Notonurus cooperi* sp. n.

Remarks.—This genus is based on a single male imago, but the character of the genitalia appears to be sufficiently distinctive to justify generic separation.

The affinities of *Notonurus* would seem to lie rather with *Ecdyonurus* Eaton and *Heptagenia* Walsh, both Palaearctic and Nearctic genera, rather than with the Ethiopian *Afronurus* Lestage, from which it differs in the expanded form of the penes lobes and the presence of titillators, characters shared by the Northern genera. The ratio of the first two tarsal joints of the third hind-leg is similar to that of *Heptagenia* ; otherwise the ratios of the leg joints are closer to those of *Ecdyonurus*, as defined in Ulmer's key to the ECDYONURIDAE (Ulmer, 1933 : 212).

Notonurus cooperi sp. n.

Imago.—In fore-wing cross-veins well marked, many thickened with pigment, giving a spotted effect. Sc and R_1 somewhat sinuous in pterostigmal area. In fore-leg ratio of the joints: femur 1, tibia 1·05, tarsus 1·3; tarsal joints: 1, 1·5, 1·5, 0·9, 0·6. In hind-leg: femur 1, tibia 0·8, tarsus 0·36; tarsal joints: 1, 1, 0·75, 0·6, 0·75.

Penes united, with a broad apical incision. On each side of this incision lie two chitinised lobes with a more membranous area between them. The margin of the inner lobes curves upwards to form a dorsal flange-like projection, while the outer lobes extend laterally in the horizontal plane. On each side of the incision, but slightly proximal to it, are two ventral serrate spines. On the ventral surface, near the base of the penes, is a bulbous projection ending in two submedian points, and bearing on each side two long outwardly directed spines. Genital styles four-jointed.

Head pale buff, with chestnut-brown mottling. Turbinate eyes piceous, ocelli white-tipped. Pro-, meso- and metathorax with chestnut-brown markings, and whitish inter-scleritic areas. Prothorax with a dark mediodorsal streak, a pale area on each side of it. Scutellum pale with dark edges. Ventral surface paler than dorsal.

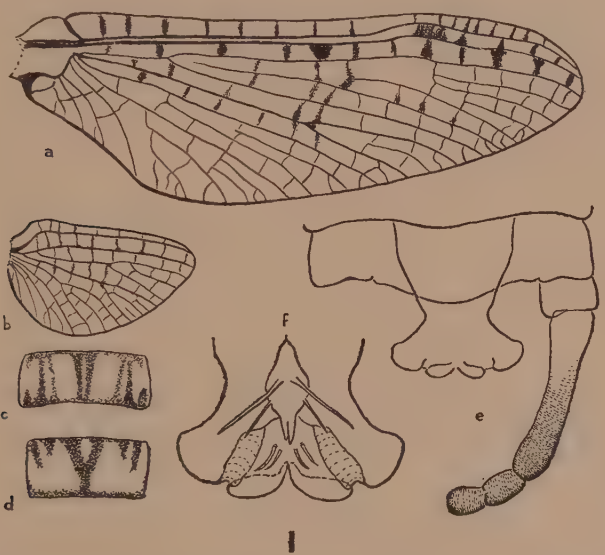

Fig. 1.—*Notonurus cooperi* gen. et sp. n.: *a*, *b*, fore-wing and hind-wing of imago; *c*, *d*, dorsal pattern of abdominal segments 3 and 7; *e*, forceps and penis, dorsal view with tenth tergite removed; *f*, ventral view of penes more highly magnified.

Abdomen with whitish ground-colour suffused castaneous, especially on posterior segments, and a well-marked pattern of deep warm brown on each segment, with a dark posterior border. Tergite 1 mostly dark, with paler dorsolateral areas. Segments 2–6 each with a median dark marking tapering posteriorly and divided by a narrow pale streak. On each side a double dark longitudinal marking and a dark lateral incomplete stripe. Segment 7 with a dark Y-shaped median mark, a small anterior marking on each side, and a longer lateral marking extending from the anterior edge. Segments 8–10 deeply suffused, 8 still showing indications of pattern, 9 and 10 almost uniform. Ventrally, anterior segments pale with lateral dark areas, posterior segments suffused. Genital styles suffused brownish. Cerci white, banded with dark brown. Legs whitish with dark areas; femora with dark areas proximally and distally, and dark stippling on anterior surface; tibiae

with two dark bands. Wings hyaline, with chestnut-brown blotches on many of the cross-veins. Neuration pale, the stronger veins slightly brownish.

Length: Body 9 mm., wing 10 mm., cerci 22 mm., fore leg 8.2 mm.

Holotype.—Male imago, Pirie Forest, February, 1944 (*J. Omer-Cooper*).

Remarks.—This interesting insect is a notable addition to the known mayflies of the Eastern Cape, and I have pleasure in naming it after its discoverer, Professor J. Omer-Cooper. It would be very desirable to find and correlate the nymph.

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BOOK NOTICE.

Simulidos del Nuevo Mundo. By Luis Vargas. Monografia I del Instituto de Salubridad y Enfermedades Tropicales. Mexico, D.F., 1945. Pp. 241, 10 pls.

This work is divided into two sections, the first and smaller of which deals with the bionomics of the insects, including their economic importance, morphology of the larvae and adults, life cycle, methods of rearing, and parasites and predators.

The second and larger section consists of a systematic survey which includes a catalogue of the subfamilies, tribes, genera, and of the New World species.

The species are also listed by countries, and there is a complete index of generic and specific names. An extensive bibliography completes the work.

ETHIOPIAN CULICIDAE—NOTES AND DESCRIPTIONS

By E. C. C. Van Someren.
(*Division of Insect Borne Diseases, Medical Research Laboratory, Nairobi, Kenya.*)

Aedes (*Finlaya*) *ingrami* Edwards.

Edwards (1941) lists four characters by which to distinguish this species from *A.* (*F.*) *wellmani* Theobald. They are, the extent of the median pair of black lines on the mesonotum, the all black fore tibiae and second tarsal joint, and the dark basal half of the posterior surface of the middle femora.

The East African specimens examined agreed with the description of *ingrami* in the character of the mid femora but, as the fore tibiae and second tarsal joints were seen to have white markings, it was thought that the East African specimens might be a geographical variety. However, on a more critical examination of a series of specimens from various localities in East Africa and Western Uganda, it was found that even among specimens from one locality the amount of white on the fore legs and the thoracic ornamentation were variable.

Two specimens of *wellmani* from Northern Rhodesia sent to me by Mr. G. G. Robinson were examined. Judging from these it appears that the adult colour pattern is variable in this species also, and Mr. Robinson informs me that the white markings on the fore tibiae and the second tarsal joint are sometimes absent in the Rhodesian specimens of *wellmani*.

It therefore appears that the thoracic and foreleg ornamentation are unreliable characters and cannot be used for differentiating these two species. The only reliable differentiating character noted was the amount of white on the basal half of the posterior surface of the mid femur, which is all white in *wellmani* and all black above with a variable amount of white below in *ingrami*.

The variations noted for *ingrami* are given below :

Adult female as described by Edwards (1941) varies as follows :—

Head : Very occasionally completely white scaled on the dorsal surface, and sometimes with a very few narrow white scales in a median line.

Thorax : Median black stripes very occasionally reaching the front margin, and very often nearly reaching the front margin. Sometimes the narrow line of creamy white scales dividing the two median black stripes is missing or only represented by a very short median posterior stripe which may or may not fork round the base space in front of the scutellum. The narrow lines of creamy scales separating the short posterior black stripes sometimes reach the anterior lateral white markings, and occasionally, where the median white stripe is missing, these lines are very short and inconspicuous. Scales on median lobe of scutellum all broad, flat, and dark or creamy white, or all narrow and white, and sometimes narrow amd broad scales mixed.

Abdomen : Tergite 5 occasionally with a small median sub-basal white spot.

Legs : The front tibia may be all dark, or with a short but distinct white stripe on the posterior surface at the base, or there may be a white posterior line reaching from the base to near the tip ; this line, if present, usually uneven and interrupted. Front tarsi occasionally have a few white scales at the base of the second segment. Mid femora sometimes white below on the basal half or more and occasionally with a white patch before the tip extending on to the dorsal surface.

Wings : Very often with a small patch of creamy white scales at the base of the costa.

Male. Head: Very often with all the scales on dorsal surface white.

Thorax: Scutum clothed with narrow white scales except for two short median black lines (on posterior third) which are divided by a broad white stripe, and two shorter dark posterior lateral stripes divided from the median stripes by a broad white stripe. Scales on scutellum narrow and white.

Abdomen: Tergites not always banded.

Specimens examined from UGANDA: Bwamba, Toro District, 14 females. KENYA: Kakamega, 1 female; Maseno, 3 females amd 1 male; Kitale, 9 females; Kaimosi, 3 females and 4 males; Maragoli, 8 females and two males; Nairobi, 16 females.

Aedes (*Finlaya*) *embuensis* Edwards.

A. (*F.*) *embuensis* Edwards (1941) was described from one very damaged female, and until more specimens are obtained from the type locality it is not possible to tell if Nairobi specimens, described below, differ from the type.

The adult ornamentation of the Nairobi specimens is very variable, and the most striking character is the banding of the mid and hind tarsi, which divides the series into two groups, one with 2 and one with 3 pale bands on the mid and hind tarsi. The larvae can also be divided into two groups, one with head-setae B and C with few branches (about 2–4), and one with head-setae B and C with 5–10 branches. This proved to be of no significance, as on examining the associated larval pelts of one group of adults, both types of larvae were encountered.

As the Nairobi specimens have all the characters attributed to *embuensis* by Edwards (1941), I determine the Nairobi specimens as *embuensis*, and the male is described below, and additional notes on the female are given.

Adult Female as described by Edwards (1941). Additional characters noted as follows:—

Head: Lateral scales on dorsal surface creamy white; yellow scales dorsally. Tori sometimes with a few short pale scales and fine hairs on the inner border.

Thorax: Scutum sometimes wholly covered with narrow golden yellow scales, in which case the scales on the posterior one-third are more scanty, and the dark integument shining through gives the impression of indistinct dark lateral lines; more often the scutum is covered with narrow golden yellow scales on the anterior two-thirds and the posterior third is yellow with two short dark median lines divided by a broad yellow line, and indications of two short dark lateral lines, which are about the length of the bare space in front of scutellum and divided from the median lines by a broad yellow line. Sometimes the dark posterior markings extend to the middle of the thorax, in which case the dividing yellow lines are narrower. Scales round bare space in front of scutellum always yellow, and sometimes there is a large or small patch of creamy white scales on pre-alar area; *apn* with broad white scales and sometimes some narrow yellow scales; *ppn* with broad or narrow white scales below, and narrow yellow scales above; paratergites with broad white scales. Scutellum covered with narrow golden scales.

Abdomen: The dark scales have a purple or coppery sheen. Tergites 2–7 sometimes with complete white sub-basal bands or only 4–7 or 5–7 banded; with or without pale median basal spots on the remaining tergites. Sternites dark with broad white basal bands, or 2–4 mainly creamy white with or without apical lateral black patches.

Legs: Dark with white or creamy white markings. Fore legs: Anterior surface of femur mainly dark with a narrow creamy white band at the base and a small white spot

below before the tip, and sometimes a narrow white line below on basal half; posterior surface white on the basal three-fifths, remainder dark with a small white patch below before the tip, the sub-apical white spots sometimes form a complete band. Tibia dark with a distinct pale stripe on the posterior surface from base to near tip. First two tarsal segments with distinct basal creamy white bands of equal width, that on the first segment may be extended below in a narrow line to a half; segments 3–5 all dark. Mid-legs: Anterior surface of femur dark with a narrow pale ring at the base and a broader one near the tip, extreme tip narrowly dark; posterior surface white on the basal three-fifths with the white markings sometimes continued below to join the large white sub-apical ring. Tibia dark, with or without a small pale basal patch on the posterior surface. First and second tarsal segments with broad pale basal bands, that on the second segment reaching to a half; third segment sometimes all dark, more often with a pale band on the basal half or less, and sometimes with only a few pale scales at the base; segments 4–5 all dark. Hind-legs: Femur pale all round on the basal three-fifths, then a broad dark ring followed by a white ring which is only about half the width of the dark ring, the extreme tip with dark scales, the sub-apical white ring may extend back in a point below. Tibia all dark. Tarsi as in the mid legs.

Male as in the female. Palpi very little shorter than the proboscis, swollen distally, and the last two segments hairy. Scutum entirely covered with narrow yellow scales somewhat paler than on the female. Abdomen with basal pale bands on tergites 2–7. Anterior surfaces of fore and mid femora darker; pale stripe on posterior surface of fore and mid tibiae sometimes indistinct; pale bands on fore tarsi occasionally narrower and indistinct; no pale band on third mid tarsal segment; hind tarsi usually with pale basal bands on the first two segments only, very occasionally a narrow pale basal band on the third segment.

Terminalia: As in *ingrami*.

Pupa: Very like *ingrami* as described by Edwards (1941). Additional characters noted as follows:—

Dorsum of thorax and first four abdominal segments dark and with dark lateral stripes on segments 5–7. P single and strong but not always longer than O or R. O with 2–5 branches or single, R single or with 2–3 branches. H about quarter the length of K, which is about the same length or slightly shorter than S and T. S single, T single or occasionally with three branches and not much shorter than S. C II about half the length of the segment and with 4–6 branches; C III the same length as C II, single, or with 2–4 branches; C IV–VII very fine and single or C IV with 2 branches. B II–III single, short, and about the same length as C; B IV–V two and a half times the length of B II; B VI–VII two-thirds the length of B V and all fine single setae. A VII half the length of A VIII, a stout simple, single, or bifid seta; A VIII stout and plumose and with 3–6 branches, one-third to half the length of the paddles. The paddles are short and either round or oval (ratio or greatest breadth to length 1 : 1·2–1·5), with a strong mid rib and a fairly distinct external buttress on basal half and with fairly conspicuous spicules on apical half. Seta single and one-sixth to a quarter the length of the paddles.

Specimens examined from Nairobi, Langata Forest, bred from tree-holes, 28 females, 1 male neallotype and 20 males with associated pupal pelts.

Aedes (*Stegomyia*) *soleatus* Edwards.

Pupa. Very like *contiguus* as described by Edwards (1941).

Dorsum of thorax and first four abdominal segments dark. Paddles pale with a dark mid rib and finely denticulate on the distal border, short and of variable shape either pointed distally or elliptical (ratio of greatest breadth to length 1 : 1·2–1·4); seta single and about one-sixth to one-fifth the length of the paddles. B II single and about the length of the segment; B III–VII single and much shorter than the segment. C II with 2–3 branches

and about half the length of B III ; C III–VII single and about half the length of B. A II–VI minute and fine ; A VII a stout bifid or single seta about half the length of A VIII and simple or finely plumose ; A VIII about one-third the length of the paddles and with 4–5 plumose branches.

Described from 5 pupal pelts with associated adults which agree with the description given by Edwards (1941) for *soleatus*, the only difference noted was in the male terminalia where one of the stout hairs on the slight projection of the inner margin of the basal lobe was flattened at the base and terminated in a long twisted filamentous point.

Bred from Bamboo pots, Gede Kenya.

Aedes (*Dunnius*) *albomarginatus* Newstead.

A number of specimens collected from Bwamba, Toro District, Uganda, and from the Kaimosi forest, North Kavirondo, Kenya, agree with the description of *albomarginatus* given by Edwards (1941). Additional characters noted for the female are given below, and the male is described.

Adult Female. As described by Edwards (1941). Additional characters noted as follows :—

In addition to the one pair of dorso-central bristles a little in front of the middle of the scutum there are two pairs near the front margin. The scutum is covered with narrow dark brown scales with two distinct, very short, creamy white posterior lateral lines which extend on to the lateral lobes of the scutellum ; the scales round the bare space are also creamy white and usually but not always there are white scales on the median lobe of the scutellum. One specimen has the pale posterior lateral lines continued forward in a broken, indistinct line to the front margin, and there is a short median posterior creamy white line to about one-third, which forks round the bare space in front of the scutellum.

Male as in the female.

Terminalia very similar to those figured by Edwards (1941) for *kummi* Edwards. The style is apically divided, like that of *kummi*, into three main arms, the lower one bearing a stout spine and a narrow prolongation of the style which appears like a blunt pointed spine ; the middle lobe is simple, and the upper lobe forked, the upper fork of which is again divided into two separate lobes, the upper of which bears a few short, blunt spines on the distal border. The number and shape of the lobes seen on the distal portion of the style depends on the angle at which it is viewed, sometimes appearing like the figure in Edwards (1941) and sometimes like that in Edwards (1930).

Specimens examined from Bwamba, Toro District, Uganda, 11 females, 3 males (*A. J. Haddow*), and the Kaimosi Forest, North Kavirondo, Kenya, 3 females, 3 males (*P. C. C. Garnham, J. O. Harper* and *R. B. Highton*).

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